

# Incentives and Effects of Publication Lags on Life Cycle Productivity in Economics

## Life Cycle Productivity

John Conley<sup>1</sup>   Mario Crucini<sup>1</sup>   Bob Driskill<sup>1</sup>   Ali Sina Onder<sup>2</sup>

29 August 2011

---

<sup>1</sup>Vanderbilt University

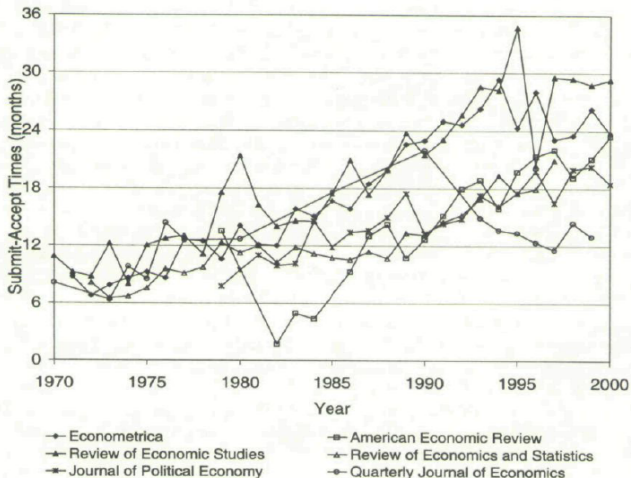
<sup>2</sup>Uppsala Universitet

# Publication Lags

- Glenn Ellison (QJE, 2002): Publication process in top economics general interest journals and in top field journals has slowed down.

# Publication Lags

- Glenn Ellison (QJE, 2002): Publication process in top economics general interest journals and in top field journals has slowed down.



# Publication Lags (cont'ed)

Why has the slowdown occurred? Ellison mentions three main reasons:

- 1 Papers today are almost twice as long as papers 30 years ago.
  - 2 Competition for publishing in very top journals is fierce. A top journal publication today is more prestigious than it was 30 years ago.
  - 3 Social norms in the profession have changed. (This accounts for 2/3 of the slowdown)
- **OUR QUESTION:** Has the slowdown in the publication process negatively affected the publication profiles of young researchers?

# Simulation: What Do We Expect?

We develop a calibrated "time to build" model in which we view new PhD recipients as:

- 1 endowed with a given number of papers,  $p$ , at graduation,
- 2 able to write a certain number of new papers,  $m$ , each year,
- 3 submitting each manuscript to a journal where acceptance occurs with some probability,  $a$ .

We explore publication life cycle in different scenarios.

# Simulation: What Do We Expect?

$a=0.2$  and  $m=1$ ,  $p=3$  then  $a=0.12$ ,  $m=0.75$ ,  $p=2.25$

Table 1. The Effect of Lags, Acceptance Rate and Manuscript Length on CVs

| Year | Length of Vitae |                |                   |                     |
|------|-----------------|----------------|-------------------|---------------------|
|      | (1)             | (2)            | (3)               | (4)                 |
|      | One year delay  | Two year delay | Longer Manuscript | Low Acceptance Rate |
| 1    | 0.60            | 0              | 0.45              | 0.36                |
| 2    | 1.28            | 0.60           | 0.96              | 0.80                |
| 3    | 2.03            | 0.80           | 1.52              | 1.30                |
| 4    | 2.18            | 1.48           | 2.11              | 1.87                |
| 5    | 3.65            | 1.84           | 2.74              | 2.50                |
| 6    | 4.52            | 2.58           | 3.40              | 3.18                |

# Simulation: What Do We Expect?

Even changing the publication game in only one or two of these dimensions, we observe substantial effects that would be enough to get a tenure case turned down.

→ Empirically, how do older and younger cohorts of economics PhD recipients compare in publication productivity?

We have three main items:

- 1 List of Economics PhD holders: John Wayne - Harvard - 1991
- 2 Journal publication database: John Wayne - AER - 1998 - 15pp - 1/5 authorship
- 3 Measures for quality control: Department rankings and Journals' quality index.



We focus on Economics PhDs obtained from a university in the USA from 1986 to 2000: Total of 14,271 PhDs from two sources.

Table A.1. Number of Ph.D.s in Economics by Data Source

| Year | AEA   | Hasselback | Overlap | Total |
|------|-------|------------|---------|-------|
| 1986 | 264   | 227        | 61      | 425   |
| 1987 | 597   | 216        | 95      | 714   |
| 1988 | 787   | 196        | 94      | 883   |
| 1989 | 953   | 230        | 147     | 1,035 |
| 1990 | 947   | 164        | 107     | 1,001 |
| 1991 | 905   | 178        | 122     | 956   |
| 1992 | 928   | 155        | 106     | 970   |
| 1993 | 1,074 | 173        | 110     | 1,132 |
| 1994 | 1,021 | 182        | 122     | 1,077 |
| 1995 | 1,025 | 170        | 109     | 1,078 |
| 1996 | 955   | 155        | 104     | 1,002 |
| 1997 | 935   | 167        | 107     | 990   |
| 1998 | 981   | 178        | 113     | 1,040 |
| 1999 | 866   | 182        | 106     | 936   |
| 2000 | 969   | 181        | 110     | 1,032 |

Note: The overlap indicates the number of PhDs common

# Publication Database

EconLit journal database from 1982 to 2006 contains a total of 615,145 entries, corresponding to 402,067 publications from 203,991 authors. "Et.al" problem of the EconLit database is corrected for Top 25 journals using the IBSS database. (We found 1,125 such publications in EconLit and corrected 558 of them).

Table A.2. Number of Publications

| Year | Number |
|------|--------|
| 1985 | 9,918  |
| 1986 | 9,872  |
| 1987 | 9,918  |
| 1988 | 10,552 |
| 1989 | 10,767 |
| 1990 | 11,254 |
| 1991 | 11,905 |
| 1992 | 13,108 |
| 1993 | 13,492 |
| 1994 | 14,374 |
| 1995 | 15,825 |
| 1996 | 17,692 |
| 1997 | 18,385 |
| 1998 | 19,869 |
| 1999 | 20,818 |
| 2000 | 21,835 |
| 2001 | 22,271 |

# Departments' and Journals' Rankings

- Tom Coupe's department rankings (adjusted for size, *ordinal*): Coupe (2003) "Revealed Performances: Worldwide Performance of Economists and Economics Departments 1990-2000," *Journal of the European Economic Association*, 1(6), 1309-1345.
- Size and impact adjusted quality ranking for journals (quality in terms of AER equivalence, *cardinal*): Kalaitzidakis et al (2003) "Rankings of Academic Journals and Institutions in Economics," *Journal of the European Economic Association*, 1(6), 1346-1366.
- $(AER\ Equiv.\ Pub)_{ij} = I_j * \frac{1}{(coauthors)_i}$
- $(AER\ Equiv.\ Pages)_{ij} = (Pages_i) * I_j * \frac{1}{(coauthors)_i}$
- Discrete quality index for journals: Combes & Linnemer (2010) "Inferring Missing Citations" manuscript.

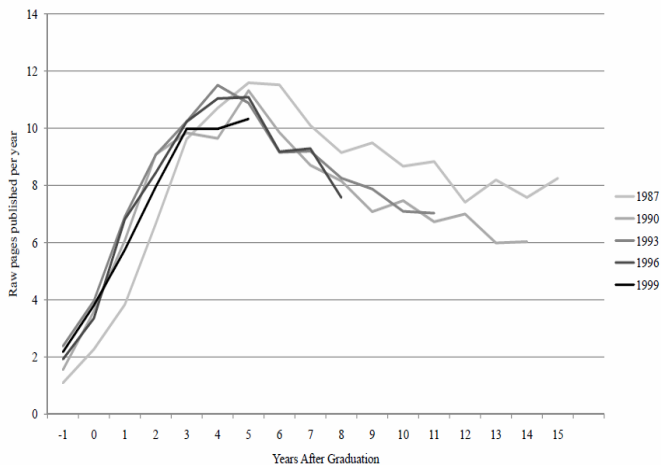
# Within Cohort Distribution

Table 2. Intellectual Lorenz Curve

| Productivity Percentile | Percent AER Pages |      |      |      |      | Percent AER Publications |      |      |      |      |
|-------------------------|-------------------|------|------|------|------|--------------------------|------|------|------|------|
|                         | 1987              | 1990 | 1993 | 1996 | 1999 | 1987                     | 1990 | 1993 | 1996 | 1999 |
| 99%                     | 86.7              | 85.5 | 83.8 | 86.3 | 84.3 | 88.1                     | 86.8 | 85.9 | 87.3 | 87.1 |
| 95%                     | 57.3              | 54.3 | 55.8 | 56.9 | 54.5 | 62.5                     | 60.6 | 60.4 | 60.8 | 59.9 |
| 90%                     | 38.3              | 35.6 | 37.2 | 37.1 | 36.3 | 43.4                     | 42.0 | 42.5 | 41.9 | 41.8 |
| 80%                     | 18.4              | 17.5 | 18.3 | 17.9 | 17.3 | 21.9                     | 21.6 | 21.9 | 21.3 | 21.0 |

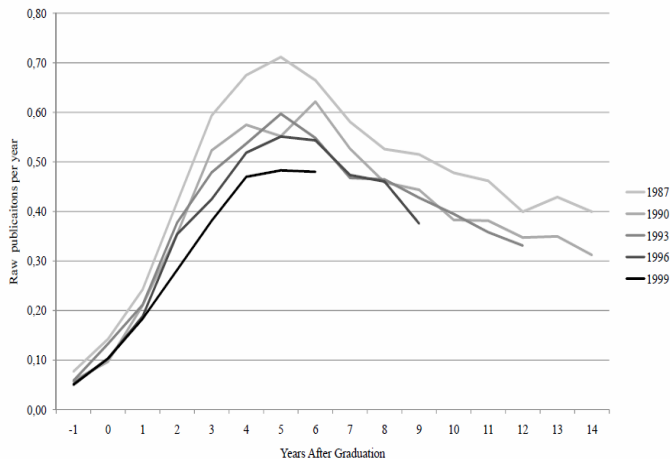
# Life Cycle Productivity in Pages

FIGURE 2. LIFE-CYCLE PRODUCTIVITY OF GRADUATES OF TOP 30 PROGRAMS  
ANNUAL RAW PAGES



# Life Cycle Productivity in Publications

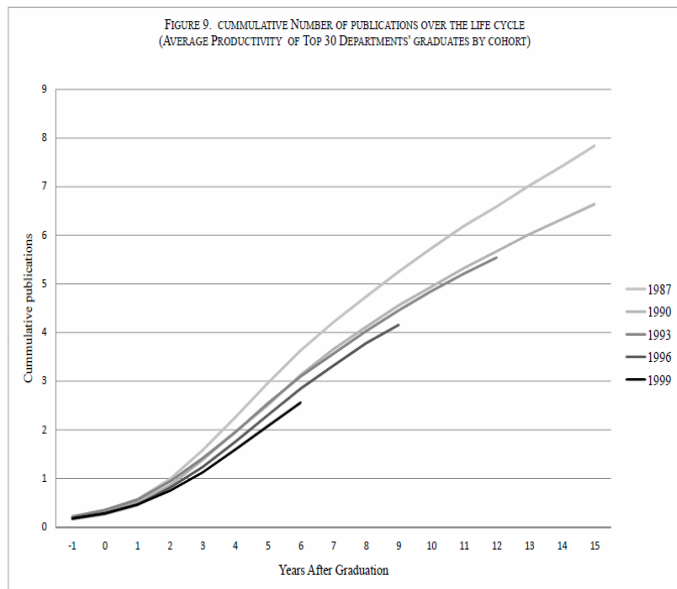
FIGURE 4. LIFE-CYCLE PRODUCTIVITY OF GRADUATES OF TOP 30 PROGRAMS  
RAW ANNUAL PUBLICATIONS



# Observations on Life Cycle Productivity

- 1 There is a consistent pattern of publication peaks at six years after graduation, and then trailing off to about 60% of the peak.
- 2 Top 30 departments' graduates are about 3 times more productive than graduates from non-top 30.
- 3 There is a *suggestion* of a productivity ranking from the oldest to the youngest cohort.

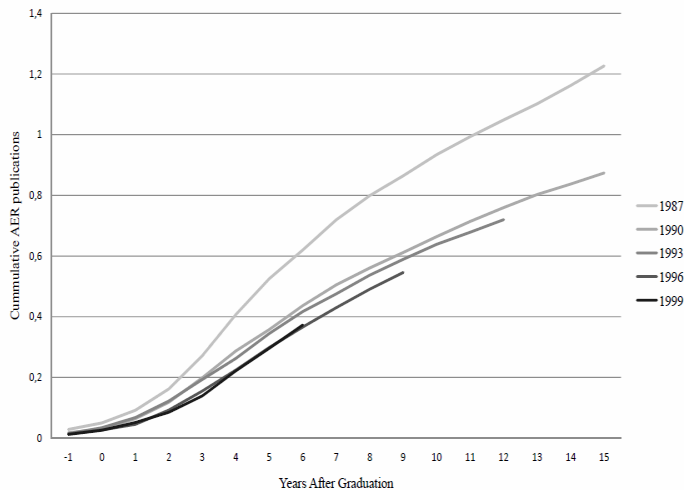
# Cumulative Publications





# Cumulative AER-Equivalent Publications

FIGURE 10. CUMMULATIVE AER EQUIVALENT PUBLICATIONS OVER THE LIFE CYCLE  
(AVERAGE PRODUCTIVITY OF TOP 30 DEPARTMENTS' GRADUATES BY COHORT)



# Productivity Across Cohorts

Table 3. Performance of Various Percentiles

| Percentiles | AER Equivalent Pages |      |      |      |      | AER Equivalent Publications |      |      |      |      |
|-------------|----------------------|------|------|------|------|-----------------------------|------|------|------|------|
|             | 1987                 | 1990 | 1993 | 1996 | 1999 | 1987                        | 1990 | 1993 | 1996 | 1999 |
| 99th        | 70.0                 | 57.2 | 69.6 | 57.3 | 65.1 | 3.87                        | 3.06 | 3.23 | 2.45 | 2.48 |
| 95th        | 33.9                 | 28.0 | 27.1 | 26.7 | 24.3 | 2.00                        | 1.48 | 1.33 | 1.28 | 1.22 |
| 90th        | 20.5                 | 14.5 | 15.9 | 15.0 | 15.0 | 1.34                        | 0.98 | 0.85 | 0.76 | 0.73 |
| 85th        | 13.6                 | 9.4  | 10.6 | 9.4  | 9.7  | 0.99                        | 0.62 | 0.61 | 0.52 | 0.51 |
| 80th        | 8.4                  | 6.2  | 7.3  | 6.2  | 6.3  | 0.62                        | 0.43 | 0.44 | 0.37 | 0.37 |
| 75th        | 6.2                  | 4.0  | 5.3  | 4.0  | 4.3  | 0.45                        | 0.31 | 0.30 | 0.26 | 0.26 |
| Median      | 1.1                  | 0.9  | 1.0  | 0.9  | 0.9  | 0.08                        | 0.06 | 0.06 | 0.06 | 0.05 |

# Observations on Cumulative Productivity (Top 30)

- 1 1987, 1990+1993, and 1996+1999 cohorts published 0.61, 0.42, 0.37 AER equivalent publications, respectively, over all within six years after graduation.
- 2 The middle cohorts are 12% more productive than the youngest cohorts, while the oldest cohort is 48% more productive than the middle and 68% more productive than the youngest.
- 3 All differences have p-values less than 0.01.

# Observations on Cumulative Productivity (Non-Top 30)

- 1 1987, 1990+1993, and 1996+1999 cohorts published 0.19, 0.16, 0.12 AER equivalent publications, respectively, over all within six years after graduation.
- 2 The middle cohorts are 33% more productive than the youngest cohorts, while the oldest cohort is 19% more productive than the middle and 58% more productive than the youngest.
- 3 All differences have p-values less than 0.01.

# A Strategic Adjustment?

## Signal-to-Noise Ratio

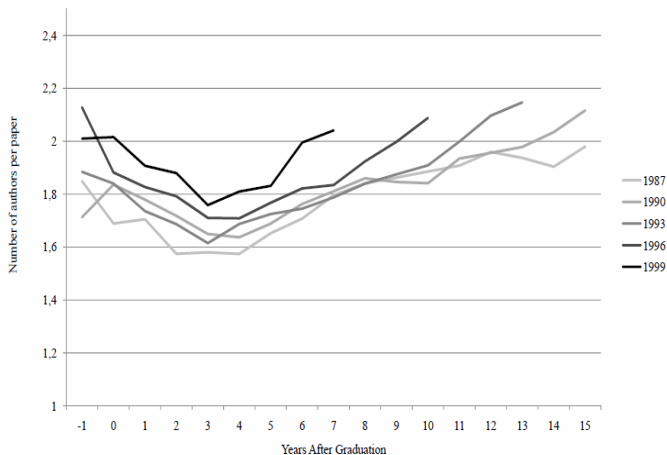
Table 5. Aggregate cohort output

|                     | Total publication output |      |      |      |      | 'Signal to noise' ratio |       |       |       |       |
|---------------------|--------------------------|------|------|------|------|-------------------------|-------|-------|-------|-------|
|                     | 1987                     | 1990 | 1993 | 1996 | 1999 | 1987                    | 1990  | 1993  | 1996  | 1999  |
| Top 30 Ph.D.s       |                          |      |      |      |      |                         |       |       |       |       |
| Total Publications  | 1988                     | 2531 | 2792 | 2468 | 2075 |                         |       |       |       |       |
| AER (Combes)        | 772                      | 877  | 964  | 843  | 756  | 0.388                   | 0.347 | 0.345 | 0.342 | 0.364 |
| AER (Kalaitzidakis) | 340                      | 359  | 387  | 325  | 313  | 0.171                   | 0.142 | 0.139 | 0.132 | 0.151 |
| Non Top 30 Ph.D.s   |                          |      |      |      |      |                         |       |       |       |       |
| Total Publications  | 1004                     | 1494 | 1527 | 1228 | 1549 |                         |       |       |       |       |
| AER (Combes)        | 250                      | 377  | 358  | 271  | 352  | 0.249                   | 0.252 | 0.234 | 0.221 | 0.227 |
| AER (Kalaitzidakis) | 72                       | 105  | 93   | 68   | 86   | 0.072                   | 0.070 | 0.061 | 0.055 | 0.056 |

# Another Strategic Adjustment?

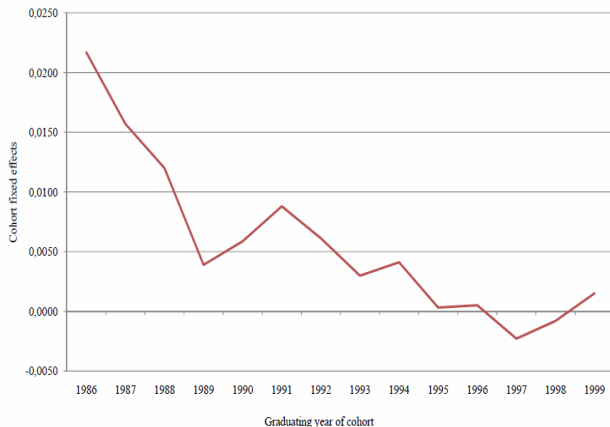
Coauthorship

FIGURE 8. LIFE-CYCLE PATTERN OF COAUTHORSHIP



# Comparing Cohorts' Tobit Marginal Effects-1

FIGURE 11. COHORT PUBLICATIONS AFTER SIX YEARS  
RELATIVE TO 2000 COHORT



# Comparing Cohorts' Tobit Marginal Effects-2

Table 7. Publication comparisons across cohorts

|      | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 1986 | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    |
| 1987 |      |      | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    |
| 1988 |      |      | +    | +    |      | +    | +    | +    | +    | +    | +    | +    | +    | +    |
| 1989 |      |      |      |      |      |      |      |      |      |      | +    | +    |      |      |
| 1990 |      |      |      |      |      |      |      |      | +    | +    | +    | +    |      | +    |
| 1991 |      |      |      |      |      |      | +    | +    | +    | +    | +    | +    | +    | +    |
| 1992 |      |      |      |      |      |      |      |      | +    | +    | +    | +    | +    | +    |
| 1993 |      |      |      |      |      |      |      |      |      |      | +    |      |      |      |
| 1994 |      |      |      |      |      |      |      |      |      |      | +    | +    |      |      |
| 1995 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 1996 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 1997 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 1998 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 1999 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |

Note: A "+" indicates the row cohort out-performed the column cohort at the 5% level of significance.



# Comparing Quintiles across Cohorts: P40 to P60

Note that having a Top 30 PhD is NOT significant for this quintile.

Table 9. Publication comparisons across cohorts (P40-P60)

|      | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 1986 |      |      | +    |      |      |      | +    |      | +    |      | +    | +    | +    | +    |
| 1987 |      |      | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    |
| 1988 |      |      | +    |      |      |      | +    | +    | +    | +    | +    | +    | +    | +    |
| 1989 |      |      |      |      |      |      |      |      |      |      |      | +    |      | +    |
| 1990 |      |      |      |      |      |      |      |      |      |      | +    | +    |      | +    |
| 1991 |      |      |      |      |      |      |      |      |      |      | +    | +    |      | +    |
| 1992 |      |      |      |      |      |      |      |      |      |      | +    | +    |      | +    |
| 1993 |      |      |      |      |      |      |      |      |      |      |      | +    |      | +    |
| 1994 |      |      |      |      |      |      |      |      |      |      | +    | +    |      | +    |
| 1995 |      |      |      |      |      |      |      |      |      |      |      | +    |      | +    |
| 1996 |      |      |      |      |      |      |      |      |      |      | +    | +    |      | +    |
| 1997 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 1998 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 1999 |      |      |      |      |      |      |      |      |      |      |      |      |      | +    |

Note: A "+" indicates the row cohort out-performed the column cohort at the 5% level of significance.

# Comparing Quintiles across Cohorts: P80 to P100

Note that having a Top 30 PhD is HIGHLY significant for this quintile.

Table 11. Publication comparisons across cohorts (P80-P100)

|      | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 1986 | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    | +    |
| 1987 |      |      | +    | +    |      | +    | +    | +    | +    | +    | +    | +    | +    | +    |
| 1988 |      |      | +    | +    |      |      | +    | +    | +    | +    | +    | +    | +    | +    |
| 1989 |      |      |      |      |      |      |      |      |      |      | +    |      | +    |      |
| 1990 |      |      |      |      |      |      |      |      |      | +    | +    | +    | +    | +    |
| 1991 |      |      |      |      |      |      | +    |      | +    | +    | +    | +    | +    | +    |
| 1992 |      |      |      |      |      |      |      |      | +    | +    | +    | +    | +    | +    |
| 1993 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 1994 |      |      |      |      |      |      |      |      |      |      | +    | +    | +    | +    |
| 1995 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 1996 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 1997 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 1998 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 1999 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |

Note: A "+" indicates the row cohort out-performed the column cohort at the 5% level of significance.

Unless we believe that new cohorts of PhD recipients are significantly less able or less hard working than older cohorts, the evidence suggests that the current publishing regime puts them in a significant disadvantageous position.

This is especially true if we look at AER-equivalent publications rather than pages since papers have increased in size. (This is partially offset if we do not fully discount for coauthorship).